

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s) Alexey S. Kabalnov

Confirmation No.: 6545

Application No.: 09/895,468

Examiner: Tran, Ly T.

Filing Date: June 29, 2001

Group Art Unit: 2853

Title: METHODS FOR DIGITALLY PRINT ON CERAMICS

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on April 11, 2005.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

() (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

() one month	\$120.00
() two months	\$450.00
() three months	\$1020.00
() four months	\$1590.00

() The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of \$500.00. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Respectfully submitted,

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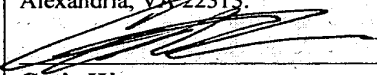
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APPEAL BRIEF
DOCKET NO. 10003878-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANT:	Kabalnov et al.	<u>CERTIFICATE OF MAILING</u> <u>UNDER 37 C.F.R. § 1.8</u> DATE OF DEPOSIT: <u>June 10, 2005</u> I hereby certify that this paper or fee (along with any paper or fee referred to as being attached or enclosed) are being deposited with the United States Postal Service under 37 C.F.R. § 1.8 on the date indicated above and is addressed to: Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313.  Catie Weaver
SERIAL NO.:	09/895,468	
FILED:	June 29, 2001	
FOR:	METHODS FOR DIGITALLY PRINTING ON CERAMICS	
ART UNIT:	2853	
EXAMINER:	Ly T. Tran	
DOCKET NO.:	10003878-1	

APPELLANTS' APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Mail Stop Appeal Brief – Patents

Dear Sir:

Appellants submit this appeal brief in connection with their appeal from the final rejection of the Patent Office, mailed January 13, 2005, in the above-identified application. A Notice of Appeal was filed on April 11, 2005.

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I. REAL PARTY IN INTEREST

The real part in interest of this application is Hewlett-Packard Company, Intellectual Property Administration, P.O. Box 272400, Fort Collins CO, 80527-2400.

II. RELATED APPEALS AND INTERFERENCES

Appellants and Appellants' legal representatives know of no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-8 remain pending. Claims 1-7 stand rejected. Claim 8 stands objected to, but was indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 9-15 have been withdrawn. Claims 16-20 have been canceled.

The claims on appeal in this application are claims 1-7, which constitute all of the claims presently pending in the application, except for claim 8.

IV. STATUS OF AMENDMENTS

No amendments to pending claims 1-7 have been made since the office action response filed by Appellant on October 29, 2004. A copy of the claims as amended at that time is contained in the Claims Appendix (with the current status of the claims identified parenthetically after each claim number), and such claims represent the claims in their current state for consideration on appeal.

V. SUMMARY OF CLAIMED SUBJECT MATTER (INDEPENDENT CLAIM 1)

1. (Previously Presented) A method for digitally printing on an article (page 5, lines 14-15) comprising:

- (a) applying a fluid glazing material to an article creating a coated surface on the article; (page 5, lines 16-18)
- (b) jetting an aqueous chromophore-containing fluid onto the coated surface; (page 5, lines 18-19) and
- (c) firing the article after the jetting step. (page 5, line 19)

In summary, the invention claimed in independent claim 1 provides method of applying color to a ceramic article by ink-jetting an aqueous chromophore-containing fluid to said article that is coated with a fluid glazing material, and then firing said article to achieve the finished product.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

35 U.S.C. § 103:

Claims 1-4 stand rejected under 35 U.S.C. § 103(a) over EP 960 873 to Tognetti et al. (hereinafter “Tognetti” but sometimes during prosecution was referred to as “Mauro”) in view of United States Patent No. 6,357,868 to Pfaff et al. (hereinafter “Pfaff”).

Claim 5 and 6 stand rejected under 35 U.S.C. § 103(a) over Tognetti in view of Pfaff and further in view of U.S. Patent No. 5,891,232 to Moffatt et al. (hereinafter “Moffatt”).

Claim 7 stands rejected under 35 U.S.C. § 103(a) over Tognetti and Pfaff and in view of Moffatt and further in view of U.S. Patent No. 4,136,076 to Daniels (hereinafter “Daniels”).

VII. ARGUMENT

A. Brief History of Prosecution

The present application was filed on June 29, 2001, as U.S. Patent Application Serial No. 09/895,468, for METHODS FOR DIGITALLY PRINTING ON CERAMICS. As filed, the Application contained 20 claims.

In the first Office Action mailed February 14, 2002, the Examiner considered claims 16-20 as distinct from the present invention; therefore, claims 16-20 were withdrawn from consideration. Claims 1-5 were rejected under 35 U.S.C. § 103(a) as unpatentable over EP 960 873 (hereinafter “Mauro,” but later referred to as “Tognetti”) in view of U.S. Patent No. 6,244,700 (hereinafter “Kimura”). Claim 6 was rejected as unpatentable over Mauro (Tognetti) in view of Kimura and further in view of U.S. Patent No. 4,256,493 (hereinafter “Yokoyama”). Claim 7 was rejected as unpatentable over Mauro (Tognetti) in view of Kimura and Yokoyama, and further in view of U.S. Patent No. 4,136,076 (hereinafter “Daniels”). Claim 8 was rejected to as unpatentable over Mauro in view of Kimura, and further in view of U.S. Patent No. 6,244,700 (hereinafter “Gelbart”). Claims 9-13 were rejected as unpatentable over Mauro in view of U.S. Patent No. 6,106,113 (hereinafter “Yamakazi”). Claim 14 was rejected as unpatentable over Mauro in view of Yamakazi and further in view of U.S. Patent No. 4, 296,493 (hereinafter “Yokoyama”). Claim 15 was rejected as unpatentable over Mauro in view of Yamakazi and further in view of Daniels.

Appellant submitted a response to the first Office Action, received by the Patent Office on June 3, 2002. In the response, Appellant affirmed the election to prosecute claims 1-15. Also, among many arguments, the Appellant argued that “the Examiner has failed to point to

anything in Mauro that would even suggest that a jetting process can be used to apply chromophores to an article for firing” and that “the Examiner has failed to point to anything in the secondary reference, i.e. Kimura, that teaches any application that would be useful for digitally printing on articles”

A second Office Action was issued on July 17, 2002. In that action, the Examiner dropped the Kimura reference but still rejected all pending claims. The Examiner rejected the claims in the same manner as the first Office Action except the Examiner used U.S. Patent No. 6,412,939 (hereinafter “Schultz”) instead of Kimura for claims 1-8, and added Schultz as a secondary reference in claims 9-15.

Appellant submitted a response to the second Office Action, received by the Patent Office on October 10, 2002. In the response, Appellant reiterated its Mauro arguments and showed that the Schultz teaching postdated Appellant’s invention. Specifically, the Appellant filed a 37 CFR 1.131 affidavit, swearing behind Schultz.

A third Office Action was issued on December 4, 2002. The Examiner accepted the Appellant’s affidavit regarding Schultz; however, all pending claims were again rejected. The Examiner rejected the claims in the same manner as in the first Office Action, except that the Examiner used U.S. Patent No. 5,681,643 (hereinafter “Noguchi”) instead of Schultz as its secondary reference for claims 1-15.

Appellant submitted a response to the third Office Action, received by the Patent Office on March 10, 2003. In the response, Appellant reiterated its Mauro arguments and further asserted that the teachings of Mauro conflicted with the teachings of Noguchi, specifically as Noguchi teaches a low temperature cure period, whereas Mauro teaches the article is fired.

A fourth Office Action was issued on May 22, 2003. The Examiner dropped the Noguchi reference and introduced U.S. Patent No. 5,714,236 (hereinafter "Withington") as yet another secondary reference. The Examiner renamed "Mauro" as "Tognetti" and substituted Withington for Noguchi in all pending claims.

Appellant submitted a response to the fourth Office Action, received by the Patent Office on August 26, 2003. In that response, Appellant argued that Tognetti does not teach ink-jetting and that combining Tognetti with Withington is improper in light of Tognetti's teachings, specifically that Tognetti's chromophore compositions are thick, and Tognetti's process induces low resolution of the design on the article. Appellant amended claim 9 in response to the Examiner's assertion that Tognetti teaches the use of transfer mediums. Appellant also slightly amended claims 1 and 8.

A fifth Office Action was issued on November 6, 2003. The Examiner claimed that the present invention consisted of two distinct species, claims 1-8 and 9-15 (The Examiner had made a typographical error and listed the species as claims 1-9 and 9-15, which was later corrected).

Appellant submitted a response to the fifth Office Action, received by the Patent Office on December 1, 2003. In the response, Appellant elected to continue prosecuting claims 1-8 (Appellant elected Species I, claims 1-9, which was later corrected to claims 1-8).

A sixth Office Action was issued on March 25, 2004. The Examiner dropped the Withington reference and substituted U.S. Patent No. 5,357,868 (hereinafter "Pfaff") as the secondary reference for all pending claims. The Examiner argued that Pfaff taught that direct printing and ink-jet printing are equivalent (the Examiner erroneously included rejections to claims 9-15 in this action, even though claims 1-8 had been elected for prosecution).

Appellant submitted a response to the sixth Office Action, received by the Patent Office on May 21, 2004. Appellant pointed out that this action represented the fourth time the Examiner had switched the secondary reference in attempts to link the primary reference of Tognetti to ink-jetting. Additionally, Appellant argued that Pfaff does not teach that ink-jetting and direct printing are equivalent, rather Pfaff teaches a unconventional method of ink-jet printing where the chromophore composition must be melted prior to printing on the article. Appellant amended claim 1 to emphasize the aqueous character of the chromophore-containing fluid.

A seventh Office Action was issued on July 30, 2004. The Examiner again substituted new references for previous ones. The Examiner rejected claims 1-4 in the same manner as before, claiming that Tognetti teaches direct printing with aqueous chromophore-containing fluid and further that Pfaff teaches that ink-jetting and direct printing are equivalent in the art, which would allegedly render the present invention as obvious to one skilled in the art. The Examiner rejected claims 5-6 in the same manner but adding U.S. Patent No. 5,891,232 (hereinafter "Moffatt") as a tertiary reference to both claims, and dropping Yokoyama as a tertiary reference with respect to claim 6. The Examiner rejected claim 7 in the same manner as in the previous office action.

Appellant submitted a response to the seventh Office Action, received by the Patent Office on November 1, 2004. Appellant amended claims 3 and 5 to more accurately reflect the aqueous nature of the chromophore-containing fluid in the present invention, as well as claim 7 to correct an error. Appellant repeated the arguments previously made, and attempted to clarify the apparent misconceptions that the Examiner had, as evident by the previously issued Office

Action. Appellant reiterated that Tognetti does not teach ink-jetting and that Pfaff does not teach aqueous ink-jetting. Furthermore, Pfaff teaches a nontraditional solid ink-jetting process by melting the inks at high temperatures prior to application.

A final Office Action was issued on January 13, 2005. The Examiner repeated the previous rejections and added no new arguments. After this eight Office Action, where the basic nature of the rejections issued by the Examiner have not substantially changed, but where the Examiner continuously changed the rejection rather than respond to the substance of the legal arguments made by the Appellants, the Appellants have decided to Appeal the application.

Appellant filed a Notice of Appeal on April 11, 2005, which was received by the Patent Office on April 14, 2005.

The shortcomings of the rejections will now be reviewed. Arguments and statements by Appellant made earlier but not repeated here are also part of the record for this appeal and are not waived; although they may be modified or supplemented herein. To keep this brief short while still trying to provide an adequate basis for review, some observations and arguments that might have been presented are not included. Accordingly, Appellants' silence herein with respect to particular statements by the Office does not indicate their agreement with or acquiescence thereto.

B. Appellants' Invention

As evidenced by the art of record, ink-jet technologies are known. The use of aqueous chromophore-containing fluids on ceramics are also known. What Appellants have invented, and set forth in the claims, is an improvement in the application of chromophore-containing fluids through the use of ink-jet technology on ceramics, resulting in a digitally printed image on the

ceramic.

To Appellants' knowledge, they were the first to use an ink-jet printer to create a digital printed image on ceramics using an aqueous chromophore-containing fluid.

C. Asserted References

1. The Tognetti Reference (also referred to as Mauro):

Tognetti teaches the direct printing process, such as silk-screening, of "a colorant liquid product" that is "thickened by a solution . . . [of] chromophores[s]. . . ." See page 2, lines 3-4, 15-17. Tognetti describes a process where the application of the colorant liquid product is further diluted once on the substrate "in order to cause displacements . . . of the chromophore salt. . . ." See page 2, lines 39-40. Tognetti describes this dilution process as "a sort of 'bleeding' of the decoration . . . ," See page 3, line 13, where the chromophore salts "are thus spread more or less randomly over . . . the tile." See page 3, line 17. Further, Tognetti uses a waterproof or semi-waterproof layer to facilitate this spreading. See page 2, lines 33-35. Tognetti only refers to the use of a less viscous fluid for application when "spray-applied," See page 3, line 50-51, which is not a printing process. Tognetti does not teach ink-jet printing.

2. The Pfaff Reference:

Pfaff teaches the use of non-conventional ink-jet technology where a "colour paste" which contains "inorganic solids . . . is applied . . . by means of a heatable inkjet print head" See col. 2, lines 40, 42-46. Additionally, Pfaff teaches that "attempts at printing ceramic colours by the inkjet process . . . have hitherto always failed . . ." since 'conventional inkjet printing processes' require 'organic colour solutions having a very low viscosity'" See col. 2, lines 3-6, and col. 1, lines 36-38. Pfaff further explains the problems with trying to ink-jet an aqueous

chromophore-containing fluid stating: “[colour powders] settle out from aqueous . . . suspensions” and “[s]uch suspensions would rapidly lead to blocking of the print nozzles and of the entire inkjet printing apparatus.” See col. 2, lines 11-12, 14-15. Pfaff solves this problem by providing a much less conventional ink-jet process where a non-aqueous colour paste is melted prior to application. See col. 2, lines 46-47. No water is used. This colour paste is produced by “grinding a mixture of pigment(s) and the component(s) of the glass flux” See col. 3, lines 24-26. Under the Examples, Pfaff specifically exemplifies the colour pastes as “85 wt. % colour powder to 15 wt. % medium,” where the medium contains alcohol, ethylcellulose, and modified colophonium resin. See col. 5, lines 26-27, 21-23. In summary, Pfaff teaches that conventional ink-jet printing of aqueous chromophore-containing fluids cannot work, hence Pfaff’s solution was to provide a novel, non-conventional, non-aqueous ink-jet printing process.

3. The Moffatt Reference:

Moffatt teaches the use of “ionic surfactants and zwitterionic surfactants” to obtain a smearfast, waterfast, and fast drying ink for ink-jet processes. See col. 1, 7-8, col. 2, lines 9-11, 13-14. Moffatt teaches that the ink may contain anionic or cationic chromophores, including nitrates and sulfates. See col. 5, lines 30-35. However, Moffatt does not teach the use of ink-jet printing on ceramics.

4. The Daniels Reference:

Daniels teaches the use of an improved ink for ink-jet printing, where the improved ink contains a polymer and a “multivalent metal ion complex” for the purposes of “cross-linking the polymer” See col. 1, line 68, col. 2, lines 1-2, col.3 lines 6-7, col. 4, lines 19-20. Daniels

does not teach ink-jet printing of aqueous chromophore-containing fluids or the use of an ink-jet process on ceramics.

D. Rejections Under 35 U.S.C. § 103(a)

The Examiner has rejected the claims on appeal under 35 U.S.C. § 103(a) as being obvious over the cited art. However, before discussing the merits of the rejection, it is thought proper to review the standards of establishing a *prima facie* case of obviousness.

1. Requirements for Prima Facie Obviousness

The issue under § 103 is whether the PTO has stated a case of *prima facie* obviousness. “The PTO has the burden under § 103 to establish a *prima facie* case of obviousness.” In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). To satisfy this burden, the PTO must meet the criteria set out in M.P.E.P § 706.02(j):

[T]hree basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Moreover, the obviousness analysis must comply with the statutory scheme as explained by the Supreme Court in Graham v. John Deere Co., 383 U.S. 1, 17 (1966), namely, consideration must be given to: (1) the scope and content of the prior art, (2) the differences between the prior art and the claimed invention, (3) the level of ordinary skill in the pertinent art, and (4) additional evidence, which may serve as indicia of non-obviousness.

In order to combine references, the prior art must provide some reason or motivation to

make the claimed compositions. In re Dillon, 16 U.S.P.Q.2d 1897, 1901 (Fed. Cir. 1990). As aptly stated in In re Jones, 21 U.S.P.Q.2d 1941, 1943-44 (Fed. Cir. 1992):

Before the PTO may combine the disclosure of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art Conspicuously missing from this record is any *evidence*, other than the PTO's speculation (if it be called evidence) that one of ordinary skill in the . . . art would have been motivated to make the modifications of the prior art necessary to arrive at the claimed (invention).

An excellent summary of how the prior art must be considered to make a case of *prima facie* obviousness is contained in In re Ehrreich et al., 590 F.2d 902, 200 U.S.P.Q. 504 (CCPA 1979). The Ehrreich court states that a reference must not be considered in a vacuum, but against the background of the other references of record. Id. at 908-909. It is stated that the question of a § 103 case is what the reference(s) would “collectively suggest” to one of ordinary skill in the art. Id. at 909. However, the court specifically cautioned that the Patent Office must consider the entirety of the disclosure made by the reference and avoid combining them indiscriminately. Id.

In finding that the “subject matter as a whole” would not have been obvious in Ehrreich, the court concluded:

Thus, we are directed to no combination of prior art references which would have rendered the claimed subject matter as a whole obvious to one of ordinary skill in the art at the time the invention was made. The PTO has not shown the existence of all the claimed limitations in the prior art or any suggestion leading to their combination in the manner claimed by applicants. (emphasis added) Id. at 910.

It has been widely recognized that virtually every invention is a combination of elements and that most, if not all, of these will be found somewhere in an examination of the prior art. This reasoning led the court, in Connell v. Sears, Roebuck & Co., 220 U.S.P.Q. 193, 199 (Fed. Cir. 1983) to state:

[I]t is common to find elements or features somewhere in the prior art. Moreover, most if not all elements perform their ordained and expected function. The test is whether the claimed invention as a whole, in light of all the teachings of the

references in their entirety, would have been obvious to one of ordinary skill in the art at the time the invention was made. (emphasis added)

In re Sernaker, 217 U.S.P.Q. 1, 5-6, (Fed. Cir. 1983) states a test to determine whether a rejection of an invention based on a combination of prior art elements is appropriate as follows:

The lesson of this case appears to be that prior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings. . . The board never showed how the teaching of the prior art could be combined to make the invention. (emphasis added)

Moreover, in In re Dow Chemical Co., 5 U.S.P.Q.2d 1529, (Fed. Cir. 1988), the court states that both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure.

The Federal Circuit stated in In re Carroll, 202 U.S.P.Q. 571, 572 (Fed. Cir. 1979):

One of the more difficult aspects of resolving questions of non-obviousness is the necessity to guard against slipping into use of hindsight (citing Graham v. Deere). Many inventions may seem obvious to everyone after they have been made...(citation of §103)...Thus, in deciding the issue of obviousness, we must look at the prior art presented from a vantage point in time prior to when the invention was made, and through the eyes of a hypothetical person of ordinary skill in the art.

With the above background in mind, Appellants contend that the Patent Office has failed to meet its burden of making a *prima facie* case of obviousness. Particularly, Appellants submit that the Patent Office has failed to show sufficient motivation to combine or modify the asserted prior art references, that each and every element of the claimed invention is not contained in the combined references, that the references do not provide a reasonable expectation of success, and that any motivation to combine references is based on impermissible hindsight.

2. Non-obviousness (Tognetti in view of Pfaff)

a) Lack of Motivation to Modify or Combine References

As described above, the invention uses aqueous chromophore-containing fluid with ink-jet technology to create digitally printed images on ceramics.

The Examiner has rejected claims 1-7 under 35 U.S.C. § 103(a). In every rejection made by the Examiner, Tognetti is cited as the primary reference and Pfaff is cited as a secondary reference. Certain dependent claims are rejected using tertiary references. All of these rejections are respectfully believed to be based on an erroneous interpretation of Tognetti and Pfaff when taken as a whole and applied to the presently claimed invention.

Tognetti teaches the application of aqueous chromophore-containing fluids on ceramics, but as the Examiner admits, does not teach the use of ink-jet printing. See final Office Action mailed January 13, 2005, page 3, lines 16-17. Thus, the Examiner has issued rejections under Tognetti in combination with a different secondary reference in several previous Office Actions. First, it was Tognetti (previously referred to as Mauro) in view of Kimura, then it was Tognetti in view of Schultz, then it was Tognetti in view of Noguchi, then it was then it was Tognetti in view of Withington, and now, it is Tognetti in view of Pfaff. In each rejection, the Examiner has tried to link Tognetti, which is in no way related to ink-jet technologies or in no way suggests the use of ink-jetting or even digital printing, with a secondary reference that does teaches ink-jetting and/or digital printing.

Pfaff teaches a process of printing non-aqueous inks by melting pigments in a thermoplastic medium, and jetting the melted inks on to various types of surfaces. In other words, Pfaff deals exclusively with so-called “solid inks” for ink-jet printing.

The motivation to combine Pfaff with Tognetti in the final Office Action by the Examiner was stated as follows:

Pfaff shows that direct printing and inkjet printing is an equivalent structure known in the art (column 2: lines 35-42). Therefore, because direct printing and inkjet printing were art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute ink jet (sic) printing for directing (sic). See page 3 of the final Office Action dated January 13, 2005.

The Applicants respectfully assert that this motivation is based on a misinterpretation of the teachings within the Tognetti and Pfaff references.

In Tognetti, the term “direct printing” is used in a phrase which states, “[t]he prior art teaches printing process for reproducing images on ceramic tiles, which processes include silk screening, direct printing, rotogravure, etc. according to which a layer of colorant powder is distributed on the glazed upper surface of the tile itself. See page 2, lines 3-5. Tognetti also states “[t]he present invention, through for example a simple silk-screening application (roller or direct) . . .” See page 2, line 13. Thus, the term “direct” is used in two contexts. One which leaves the impression that “direct printing” is another specific type of printing, like silk-screening or rotogravure printing. Alternatively, the term “direct” is taught as being a type of silk-screening. In either context, neither addresses ink-jet printing.

In the printing arts, often “direct printing” is associated with gravure printing, which utilizes a metal printing cylinder onto which the image is etched. The etched image is rolled onto a print medium to directly print the image thereon. In other words, the term “direct” when referring to printing is only relevant as it relates to the type of printing process that is being used, and indicates that the colorants are applied directly to a surface. For example, silk-screening can be by direct or roller printing, gravure printing is a form of direct printing, etc. All printing types

discussed in Tognetti relate directly to “contact” printing methods where an ink-laden device is directly contacted to a print substrate, and further, all examples of printing processes given in Tognetti are printing process that are used to print highly viscous colorant compositions. There is no teaching or suggestion in Tognetti of any printing process similar to any ink-jet printing technology, which by definition, utilizes architecture that never contacts the print medium. Further, aqueous “inks” are applied in the present invention which have a consistency of composition that is far different than the thickened composition applied in Tognetti. Thus, the term “direct printing” has nothing to do *per se* with ink jet printing in the context of Tognetti.

Pfaff discusses direct printing in the context of ink-jet printing when it refers to printing directly on an article, and indirect printing when it refers to printing on a transfer material for later application to the article. Thus, to say that direct application of colorant by printing is an “equivalent structure” to inkjet printing in general is not a valid comparison. Virtually any type of printing can be used to directly apply colorant to a substrate, and as technology evolves, there will likely be new technologies emerging that print ink directly on articles. This is the essence of printing, i.e. applying colorant to articles. This being stated, even in Pfaff, the “direct printing” discussed therein is related to printing solid inks in the form of melts, not aqueous ink-jet inks as described in the Appellants’ application, and thus, still does not teach direct printing of aqueous ink-jet inks onto to ceramic articles.

Since Pfaff does not teach that the direct printing of Tognetti and ink-jet printing would be considered to be equivalent by one of ordinary skill in the art, the rejections are based on an erroneous interpretation of the art. As a result, Appellant submits that sufficient motivation to modify or combine each of the asserted references in order to arrive at the presently claimed

invention is lacking, and therefore the Examiner failed to establish a *prima facie* case of obviousness.

As a further note, the Examiner also stated in the final Office Action that “Tognetti et al. discloses a method for printing on an article using any types of printing process (Page 2: line 3-15)” (emphasis added) See page 3, lines 5-6. This is not an accurate restatement of Tognetti. Tognetti only references printing process such as “silk screening, direct printing, rotogravure, etc.” (emphasis added) See page 2, lines 3-4. Ink-jet printing would not be considered to be within this category of printing by one skilled in the art for at least the reasons set forth above.

b) Teaching Away

The Examiner’s primary and secondary references teach away from the present invention. Specifically, Pfaff teaches away from the ink-jetting of chromophores in an aqueous vehicle by stating the following:

The use of inorganic pigments and especially inks having a high content of inorganic pigments leads to problems in the inkjet printer because the specifically heavy pigments. See col. 1, lines 42-45.

[and]

Attempts at printing ceramics [sic] colours by the inkjet process and hence making the inkjet process available also for decorating ceramic articles, such as glass, enamel and porcelain, have hitherto always failed owing to the pronounced tendency of the specifically heavy and coarse colour powder to form a sediment. See col. 2, lines 3-8.

As is clear from the above-listed quotes from Pfaff, this reference goes to great lengths to state that more conventional ink-jet printing approaches, such as by printing suspensions, do not work. Hence, Pfaff provided a novel, less conventional ink-jet process for jetting non-aqueous

molten solid inks as opposed to the conventional aqueous ink-jet process currently employed by the present invention.

Additionally, Tognetti teaches away from a digitally printed image by describing the “colorant” as a “solution thickened with chromophore metal-organic salts.” See page 2, lines 16-17. After application of the colorant, Tognetti’s process includes “wetting the decoration . . . in order to cause displacements” See page 2, line 39. Tognetti further describes this process as “a sort of ‘bleeding’ of the decoration” so that “[t]he chromophore salts, by effect of the bleeding action . . . are thus spread more or less randomly” See page 2, lines 16-17. Further, Tognetti requires the application of a “waterproof or semi-waterproof surface” to facilitate this bleeding. See page 2, lines 33-40. This teaching contrasts sharply to the present invention where the jetting of an aqueous chromophore-containing fluid is used to produce a digital image.

c) Lack of Each and Every Element on Combined References

Assuming, *arguendo*, that the cited references were properly combined. Even so, they still would not teach each and every element of the claimed invention. It is important to note that conventional liquid or aqueous ink-jettable compositions differ substantially from the color-imparting compositions that are applied by other methods, such as by the other viscous liquid printing methods of Tognetti. Additionally, Pfaff itself delineates conventional aqueous inks for ink-jet printing from the ink-jet printing of the solid thermoplastic colour paste that is described therein. Thus, even if Tognetti and Pfaff are combinable, neither reference, alone or in combination., teaches the jetting of aqueous chromophore-containing fluid. As one of ordinary skill in the art knows, particulate size, fluid viscosity, and other variables are significant

considerations taken into account in making an aqueous composition that is capable of use in conventional ink-jet applications. Conventional ink-jet printing requires much different viscosities and printing fluid characteristics in comparison with the printing methods taught and exemplified in Tognetti and the solid thermoplastic molten composition printed in Pfaff. In fact, Pfaff itself teaches that conventional aqueous inks are very different than color pastes (such as those described in Tognetti), teaching viscosities of 1 to 10 mPa s for inks and 5000 mPa s for color pastes that are used for screen printing. In other words, Pfaff provides evidence that silk-screening compositions have little in common with aqueous ink-jetable compositions, e.g., method of application requires contact vs. no contact, viscosity very high vs. very low, paste-like vs. more water-like, etc.

For at least these reasons, Appellants contend that the Patent Office has failed to establish a *prima facie* case of obviousness, and submit that the rejection is improper and should be reversed.

d) Motivation to Combine Based on Hindsight

It is further the Appellants' assertion that the present combination of references could have only been perceived as relevant to each other and assembled after having first read Appellants' disclosure, and then entered the rejection(s) by using hindsight analysis. Such a combination based on hindsight has been determined by the courts to be impermissible, as noted in the above-recited legal standards. Specifically, it is only by hindsight analysis that one would think to substitute ink-jet printing for silk-screening processes or other exemplified viscous printing processes, as there is no suggestion to make such a modification in the Tognetti reference.

3. Non-obviousness (Tognetti in view of Pfaff and Moffatt)

The arguments present in sections VII/D/2/a-d above apply to this rejection as well, and are incorporated herein by reference. In addition, the rejection of these claims also utilizes Moffatt, which teaches the use of an ink that may contain anionic or cationic chromophores, including nitrates and sulfates. See col. 5, lines 30-35. In addition to the arguments set forth above, it is the Appellants' assertion that Moffatt cannot be properly combined with Pfaff and Tognetti, as Moffatt does not teach ink-jet printing on ceramics. Further, Pfaff teaches away from aqueous ink-jet printing, and thus, is not properly combinable with Moffatt.

4. Non-obviousness (Tognetti in view of Pfaff, Moffatt, and Daniels)

The arguments present in sections VII/D/2/a-e above apply to this rejection as well, and are incorporated herein by reference. In addition, the rejection of this claim also utilizes Daniels, which teaches the use of an improved ink for ink-jet printing, where the improved ink contains a polymer and a "multivalent metal ion complex" for the purposes of "cross-linking the polymer . . ." See col. 1, line 68, col. 2, lines 1-2, col.3 lines 6-7, col. 4, lines 19-20. Daniels does not teach ink-jet printing of aqueous chromophore-containing fluids as claimed in the present application, nor does it teach printing on ceramics using an ink-jet process, and thus, is not particularly applicable to the claimed invention.

E) Objection to Specification

As an informal matter, the Examiner objected to the specification regarding the use of "metal salt" versus "metal sulfate salt." This will be corrected at a later date, if necessary.


F) Conclusion

In conclusion, Appellants respectfully submit that the claims on appeal set forth in the appendix are patentably distinct from the asserted prior art references. Particularly, none of the asserted references, nor the combination thereof, motivates, teaches, or suggests with the requisite specificity to one of ordinary skill in the art, within the meaning of 35 U.S.C. § 103, to arrive at the presently claimed invention. Both Tognetti and Pfaff also teach away from the claimed invention. Moreover, Appellants contend that even if such combinations were made, that each and every element is not present in the combination of Tognetti and Pfaff with respect to claims 1-4, and that other combinations fail to provide for a *prima facie* case of obviousness as asserted by the Examiner. Further, Appellants submit that the obviousness rejections are based on an erroneous hindsight reconstruction of the references in view of Appellants' specification and claims, rather than solely on the information contained in the cited references and the knowledge available to one of ordinary skill in the art at the time the invention was made.

Since the Patent Office has not met its initial burden of establishing a *prima facie* case of obviousness, Appellants respectfully submit that the rejection is improper, and should be overturned.

For at least these reasons, Appellant submits that the pending claims are patentable, and respectfully request that this honorable Board of Appeals reverse all the rejections and remand the case to the Examiner for allowance.

Dated this 10th day of June, 2005.


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VIII. CLAIMS APPENDIX

1. (Previously Presented) A method for digitally printing on an article comprising:
 - (a) applying a fluid glazing material to an article creating a coated surface on the article;
 - (b) jetting an aqueous chromophore-containing fluid onto the coated surface; and
 - (c) firing the article after the jetting step.
2. (Original) A method as in claim 1 wherein the fluid glazing material contains an underprinting agent.
3. (Previously Presented) A method as in claim 1 further comprising the step of jetting a fluid primer containing an underprinting agent onto the coated surface, such that the fluid primer contacts the aqueous chromophore-containing fluid.
4. (Original) A method as in claim 1 wherein the article is a ceramic.
5. (Previously Presented) A method as in claim 1 wherein the aqueous chromophore-containing fluid comprises a transition metal salt.
6. (Original) A method as in claim 5 wherein the transition metal salt is selected from the group consisting of nitrates, chlorides, acetates, chromates, citrates, sulfates, and combinations thereof.
7. (Previously Presented) A method as in claim 5 wherein the metal ion provided by the transition metal salt is selected from the group consisting of cobalt, iron, chromium, copper, manganese, nickel, uranium, lead, gold, molybdenum, silver, tin, vanadium, cesium, neodymium, and combinations thereof.

8. (Previously Presented) A method as in claim 1 wherein an additional coating selected from the group consisting of a glaze, an adhesive, a colorant, and a reflective material is applied prior to firing.

9. (Withdrawn) A method for digitally printing on a ceramic article comprising:

- (a) applying a fluid glazing material to an article creating a coated surface;
- (b) jetting an aqueous chromophore-containing fluid onto a transfer medium;
- (c) adhering the transfer medium to the coated surface; and
- (d) subsequently firing the article having the transfer medium adhered thereto.

10. (Withdrawn) A method as in claim 9 wherein the fluid glazing material contains an underprinting agent.

11. (Withdrawn) A method as in claim 9 further comprising the step of jetting a fluid primer containing an underprinting agent onto the coated surface.

12. (Withdrawn) A method as in claim 9 wherein the article is a ceramic article.

13. (Withdrawn) A method as in claim 9 wherein the chromophore-containing fluid comprises a transition metal salt.

14. (Withdrawn) A method as in claim 13 wherein the transition metal salt is selected from the group consisting of nitrates, chlorides, acetates, chromates, citrates, sulfates, and combinations thereof.

15. (Withdrawn) A method as in claim 13 wherein the metal ion provided by the transition metal sulfate salt is selected from the group consisting of cobalt, iron, chromium, copper, manganese, nickel, uranium, lead, gold, molybdenum, silver, tin, vanadium, cesium, neodymium, and combinations thereof.

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

IX. EVIDENCE APPENDIX

(No matter presented)

X. RELATED PROCEEDINGS APPENDIX

(No matter presented)